

July 7, 1961

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To: [redacted]

cc: [redacted]

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From: [redacted]

I have reviewed the copy of the fuel tank and flow system which was transmitted with your memorandum of July 3 and while I am not an expert on these matters this diagram leaves a lot to be desired.

First, I concur with you that it is a must that a final filter should be required after all the plumbing and located just off the concrete apron. We always use a final filter. We normally buy Purolator equipment and specify that it should be the same as supplied to the Esso Oil Company for hydrant use. In any tank farm where there are valves, by-pass lines, pumps, there is bound to be a failure and a last chance filter is essential. There are, of course, no details on the tanks and one of the things that we should be sure is that the vent lines either have a liquid lock or that the air is thoroughly filtered because when we draw fuel out, air will have to be sucked in to replace the fuel and if this draws in dust and dirt it won't be long before we have a real gravel problem. The tanks must also contain many other things, such as fuel sampling hatches and most essential is a liquid level indicator and high and low pressure devices. I assume that somebody is going to detail these things but they should not be overlooked. On the particular drawings I have the day tanks are marked to be 25 gallon tanks. I assume this is an error and they should be 25,000 gallon tanks. These tanks must also have filtered air plus sampling hatches, level indicators, etc.

On the approach to the day tanks there seems to be a T connection with no valves. I think at this location it would be well to put in four valves because if you ever wanted to put one tank completely out of the system it would be impossible the way it is drawn. Further, the size of the lines seems to be outstandingly generous, particularly 8" lines to the hydrants. It is my understanding that these hydrants are to be 4" each and inasmuch as the flow rate is in proportion to the square of the diameter, a 6" line would be adequate. There are, of course, advantages in keeping the lines' size correct not only from a cost standpoint but from a strength standpoint. There should also be a shutoff valve near the final filter which would assure the stoppage of fuel flowing to the apron in case of an emergency, such as a fire or a hydrant hose breaking or becoming disconnected. This emergency switch that operates the pumps and valves should be located as conveniently as possible to the concrete apron for just such an emergency. There seems to be a lot of 12" and 8" lines that I think are more than generous but they probably won't hurt anything.

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I assume that provisions will be made for a refueler truck and another tank to take care of defueling the airplane. This will be most essential in the early phases until we can tell whether the fuel that is brought back has been abused to the point where it is no longer usable and might even poison any fresh fuel. This fuel will have to be held or thrown away until the necessary inspections can be made. I assume that the actual detailing of these systems will be done by people skilled in designing this type of equipment.

If I can be of any further help please let me know.

Regards,

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EAD:as